

REMARKS

It is noted, with appreciation, that claims 8-10 have been allowed and that claim 6, although objected to would be rendered allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims.

Claims 1, 3 and 5 have been rejected by the Examiner under 35 USC 102(b) as being anticipated by Sugitani et al., U.S. Patent 4,611,219. Also, claims 11 and 12 have been rejected by the Examiner under 35 USC 102(b) as being anticipated by Matsumoto et al., DE 3820082A1. These rejections are respectfully traversed.

In rejecting claims 1, 3 and 5, the Examiner has relied upon the newly cited Sugitani et al. reference. However, the print head as disclosed by the Sugitani et al. patent is completely different from the print head of the present invention. According to the present invention, ink channels requiring high definition are defined in a channel plate whereas an ink reservoir, requiring low definition processing, is formed in a base member made of an inexpensive material when compared to the expensive material from which the channel plate is made. The Sugitani et al. patent does not disclose the fact that an ink reservoir is formed in a base member. The base member of Sugitani et al., referred to as element (1) only contains fluid connections 4-1 and 4-2 with which in all probability communicate with an external ink supply and liquid chamber 6. These fluid connections are clearly ink supply passages like ink

supply passes 40 of the present application and clearly are not ink reservoirs such as element 32 of the present invention. The liquid chamber (6) may constitute an ink reservoir, but this ink reservoir is formed in element 5 (referred to by the Examiner as a channel plate) instead of in the base member according to the present invention. Thus it is believed that claim 1 is clearly patentably distinguishable over the teachings of the Sugitani et al. patent. In any event, to more clearly define the difference between the Sugitani et al. patent and the present invention, claim 1 has been amended to recite that a flexible sheet covers the surface of the channel plate where the plurality of ink channels are formed for preventing exposure of the actuators to the ink. This addition to claim 1 is clearly supported by the description found on page 3, lines 11-14 and Figs. 1-3, element 18 of the present application.

As noted hereinabove, claims 11 and 12 have been rejected by the Examiner under 35 USC 102(b) as being anticipated by Matsumoto et al. This rejection is based on the assumption that the electrodes of Matsumoto et al. are actuators. This is clearly incorrect as addressed in the Applicants' response to the previous Office Action letter. To eliminate any confusion with respect to this point, claims 11 and 12 have been amended to specifically recite that electrodes are associated with each of the actuators.

In paragraph 5 on page 4 of the Examiner's Office Action, the Examiner argues that element 1 of Fig. 1 is a channel plate having ink channels. Furthermore, the Examiner also identifies the actuators as element 1,

composed of a piezoelectric member. In other words, the so-called channel plate and actuators are one and the same members. Since the actuators and the channel plate in the present invention are clearly separate members, it is apparent that the ink jet print head of the present invention is structurally different from that of the Matsumoto et al. patent.

As recited in claim 1 of the present application, actuators are elements respectively associated with each of the ink channels for pressuring ink contained in the ink channels. As clearly explained on page 3, lines 25-30 and page 4, lines 26-30 of the present application, when operating a print head, electrical signals are supplied to the individual actuators 22 so that the actuators perform expansion and retraction strokes toward and away from the associated ink channel so that the ink contained therein can be pressurized, causing ink droplets to be jetted out. In other words, the actuator is an element which is responsive to an electrical signal and mechanically activates the ink contained in the associated ink channel. This is further supported by the fact that to achieve this end, the actuator is composed of a piezoelectric material.

The electrodes 8 of the Matsumoto et al. reference are provided on both sides of the piezoelectric plate 1. Electrodes, for example, element 8 in the Matsumoto et al. reference and element 24 in the present application are generally known as being electrical conductors. They are used to pass electrical signals to the actuators which, in response to the signals,

mechanically activate the ink contained in the ink channel. Electrodes, for example element 8 in Matsumoto et al. and element 24 in the present application, are usually metals which are incapable of performing a mechanical activation. However, a piezoelectric material is capable of mechanical activation when responding to an electrical signal. Thus, it is clear that the piezoelectric plate of the Matsumoto et al. reference is an activator and simultaneously a channel plate, as previously understood by the Examiner. In any event, it is noted hereinabove, claims 11 and 12 have been amended to specifically recite the electrodes, and their association with each of the activators for individually energizing the activators.

Accordingly, in view of the above amendments and remarks, reconsideration of the rejections and allowance of all of the claims of the present application are respectfully requested.

Conclusion

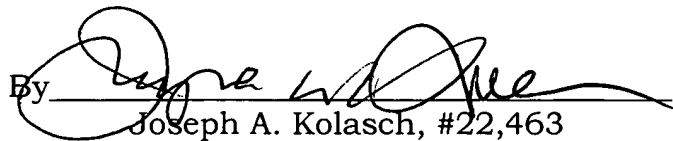
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Mr. Joseph A. Kolasch (Reg. No. 22,463) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Pursuant to the provisions of 37 C.F.R. §§ 1.17 and 1.136(a), the Applicant respectfully petitions for a one (1) month extension of time for filing a response in connection with the present application and the required fee of \$110.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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